Topology and its Applications 96 (1999) 277–278

TOPOLOGY AND ITS APPLICATIONS

www.elsevier.com/locate/topol

Erratum

Correction to “Long chains of topological group topologies—A continuation”, Topology and its Applications 75 (1997) 51–79 ☆

W.W. Comfort [a], Dieter Remus [b,*]

[a] *Wesleyan University, Middletown, CT 06459, USA*

[b] *Institut für Mathematik, Universität Hannover, Weifengarter 1, D-30167 Hannover, Germany*

Theorem 6.11 of our article [2] asserts that if $(G, \mathcal{T})$ is a pseudocompact, connected topological group, then every pseudocompact group topology on G containing $\mathcal{T}$ is also connected. That assertion is false. The following recent result of Comfort and Galindo [1] clarifies the situation.

Theorem. *Let $(G, \mathcal{T})$ be a non-divisible, connected, pseudocompact Abelian topological group. Then there is on G a non-connected, pseudocompact group topology properly containing $\mathcal{T}$.*

[The error in our purported proof of Theorem 6.11 is easily identified. It is a result of Mycielski [3] that a compact topological group is connected if and only if it is divisible; hence the completion $(\overline{G, \mathcal{T}})$ of a pseudocompact, connected group $(G, \mathcal{T})$ is divisible. Contrary to our statement in [2], however, there is no reason to believe that G itself, nor its completion in a supposed larger pseudocompact topology, is divisible. Indeed it is noted elsewhere in [2] that the existence of non-divisible (dense, connected) pseudocompact subgroups of compact connected groups has been known for some years [4]. In [1] the authors show that for every non-divisible connected pseudocompact Abelian group $(G, \mathcal{T})$ there is on G a (necessarily non-connected) pseudocompact group topology $\mathcal{U}$, properly containing $\mathcal{T}$, such that $(G, \mathcal{U})$ is algebraically homeomorphic for some prime p to a dense subgroup of the non-connected group $(G, \mathcal{T}) \times \mathbb{Z}(p)$.]

We take this opportunity to remark that Theorem 7.2 of [2], which invokes the earlier Theorem 6.11 in its proof, remains secure; its apparent dependence upon Theorem 6.11 is illusory. For the proof it is enough to invoke instead Lemma 6.6 of [2], which shows

☆ PII of original article: S0166-8641 (96) 00078-8

* Corresponding author.

PII: S0166-8641(99)00088-7

correctly that every pseudocompact group topology containing a compact, connected group topology is itself necessarily connected.

References

[1] W.W. Comfort, J. Galindo, Extremal properties concerning pseudocompact groups (title tentative), Manuscript in preparation, 1999.
[2] W.W. Comfort, D. Remus, Long chains of topological group topologies—A continuation, Topology Appl. 75 (1997) 51–79.
[3] J. Mycielski, Some properties of connected compact groups, Colloq. Math. 5 (1958) 162–166.
[4] H.J. Wilcox, Dense subgroups of compact groups, Proc. Amer. Math. Soc. 28 (1971) 578–580.